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# ALCOHOL PROBLEMS AND THEIR PREVENTION

A Public Health Perspective



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## **The Disease Concept of Alcoholism**

During the past 35 years, moralistic concepts of alcoholism have been largely replaced by an essentially classical disease concept. The latter is well-reflected in the contention of one prominent worker in the alcohol field who said of the alcoholic: "[He] is no more a drinker than a kleptomaniac is a customer or a pyromaniac is a campfire girl. Alcoholics may consume alcohol. They do not drink" (1). In this view, the alcoholic is perceived to be not simply an excessive user of alcohol but as differing fundamentally from the social drinker. He is believed to be suffering from a specific disease of which his peculiar alcohol use is symptomatic. Alcohol itself is held to be of little importance. The position is clearly exemplified in a recent submission to Government prepared by the Association of Canadian Distillers: "Alcohol and alcoholism are two entirely different subjects—while alcoholism is a major health problem, alcohol is not. Just as sugar is not the cause of diabetes, alcohol is not the cause of alcoholism" (2). The emphasis that has been placed, during the post-war period, on the treatment of alcoholics as the main remedial measure flowed logically from the disease concept. On the other hand, the concept seems to preclude any measure of primary prevention until the unique predisposing factor is discovered. How can a disease be prevented if its cause is not known?

More recently, the outcome of many years of research has led to a questioning of so narrow a view of the nature of alcoholism. Certainly alcoholics—at least those in alcoholism treatment centres—have been

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found to differ in a great many ways from other drinkers. However, these differences have proved, more often than not, to be consequences rather than causes of heavy alcohol use. Even where apparently predisposing factors have been discovered, these have been non-specific, that is to say, characteristics which are often found in the background of many patients suffering from other types of behavioral problems.

One must emphasize that to challenge the classical disease concept is not to deny that those now labeled alcoholic are usually very sick people in need of help. Rather one challenges the usefulness of the assumption that the illness exhibited is the product of a unique susceptibility to alcohol.

The related assumption that alcohol problems are primarily associated with the alcoholic is also questionable. For example, the risk of physical disease resulting from heavy alcohol use is now known to rise significantly at levels of consumption much below those ordinarily associated with alcoholism. Alcoholics seen in clinics typically drink in excess of 18 centiliters of absolute alcohol per day (the equivalent of about 2/3 of a bottle of distilled spirits or 12 bottles of beer) (3). However, an intake of only 1/3 as much, consumed regularly over long periods, measurably increases the risk of cirrhosis and cancers of the upper digestive and upper respiratory tracts (4).

These developments in research have led to a re-examination of the traditional approaches to management of alcohol problems. Clearly the forms of drinking that are relevant, from a public health point of view, extend over a much wider range of consumption than was previously thought; the alcoholics, as we know them from clinics, constitute only a minority among the drinkers who consume quantities that are liable to produce illness and early death. Consequently, research attention has shifted from the questions as to what causes alcoholism to what determines the number of drinkers who consume at levels associated with elevated risks of disease.

### **Consumption Level and the Prevalence of Heavy Users**

Of particular relevance in this respect is the vast amount of evidence that has now accumulated which makes it increasingly clear that the level of consumption in a population is an important determinant of the



prevalence of users of hazardous amounts: the larger the amount of alcohol consumed by a population as a whole, the higher will be the number of heavy consumers.

Graph 1 illustrates this point in that it demonstrates the close relationship between per capita alcohol consumption and cirrhosis death rates in Ontario. Cirrhosis is very common among heavy drinkers and the importance of heavy alcohol intake as a cause of this disease has been established beyond doubt. For these and other reasons, changes in the number of deaths from cirrhosis have been found to be a very satisfactory indicator of changes in the number of chronic heavy alcohol users in a population (4). The very close association between rates of death from this disease and per capita consumption, as shown in this graph, demonstrates that the overall level of use has a bearing on the magnitude of alcohol problems in society. This association has been confirmed by a long series of investigations involving data from many different countries and periods of time. The picture that emerges is consistent; the rate of heavy use, as reflected in cirrhosis death rates, rises and falls with the level of alcohol consumption in the population (4). This observation has led to two main areas of current research: 1. the study of trends in consumption and in the magnitude of alcohol-related damage in general populations, 2. the search for means to control overall consumption.

### **Trends in Consumption and Alcohol Problems**

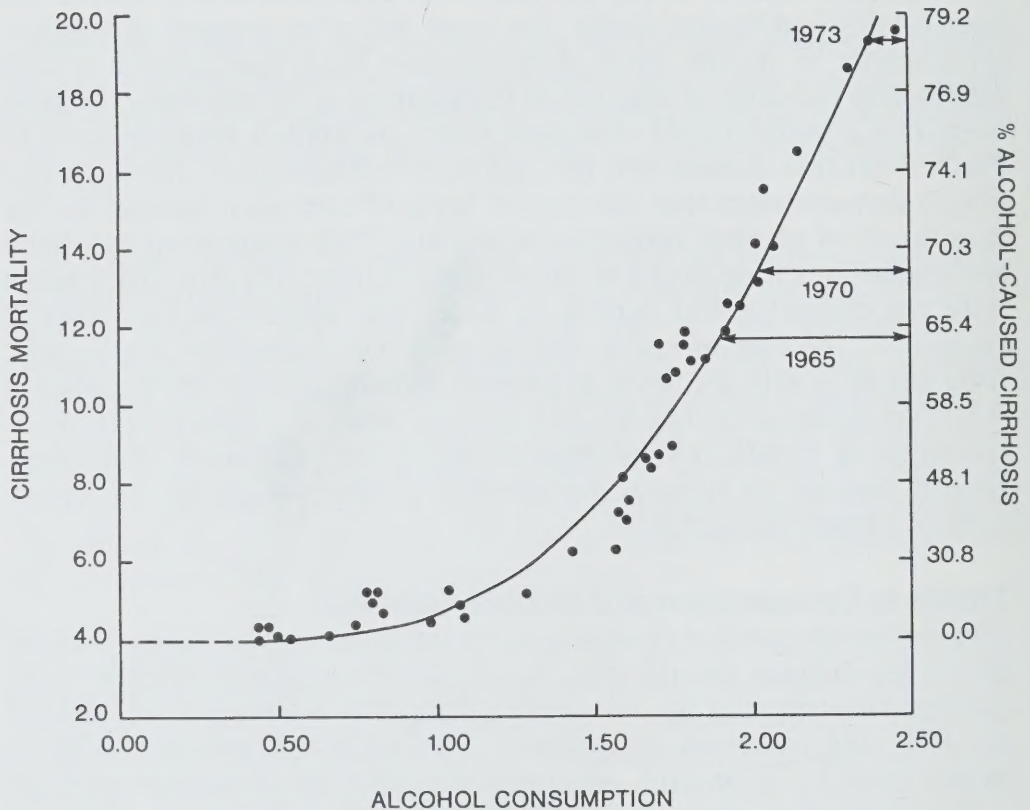
The worldwide trend in consumption is quite unmistakable. Even crude estimates indicate clearly that, in most industrialized countries, the average consumption has risen more than 40% during the period 1960 to 1973, and increases in excess of 70% over this period are by no means rare (7). In Ontario, per capita consumption of alcohol rose from 1.79 gallons of absolute alcohol in 1960 to 2.47 in 1974, an increase of 72% (5,6).

These increases invariably resulted in higher rates of excessive use and alcohol-related problems. The most revealing statistic in this respect is the cirrhosis death rate.

It should be emphasized again that the cirrhosis death rate is employed because of its particular value as an indicator of heavy consumption and not because it is by any means the sole or most important consequence

# GRAPH 1

THE RELATIONSHIP BETWEEN PER CAPITA ALCOHOL CONSUMPTION AND LIVER CIRRHOSIS DEATH RATES ON THE BASIS OF ONTARIO DATA FOR THE YEARS 1932-1973 (5,6).





of heavy drinking. Alcohol use is also a factor in the etiology of gastritis, pancreatitis, cardiomyopathy, peripheral neuropathy, and toxic psychosis. Alcohol use is definitely related to cancer of the mouth, pharynx, larynx, and oesophagus and is a major factor in suicide, assault, and accidents (4). This is to say nothing of its impact on industry through reduced productivity and absenteeism, and its role in family breakdown and child neglect. But only cirrhosis has proved to be a fully reliable index of the magnitude of alcohol problems in a population. Therefore, the statistics in Graph 2 may be understood to indicate the trend in chronic alcohol problems generally rather than in this disease exclusively.

Throughout the post-war period, deaths from cirrhosis have been increasing at a steady and often rapid rate in most parts of the world, including the provinces of Canada. Graph 2 clearly shows the increase for Ontario, and indeed, the male rate has nearly tripled over the past 20 years.

Table 1 indicates that the increase has been greatest among persons 35 to 49 years of age and least among those over 65. As one might expect under these circumstances, the mean age of death has decreased. For Ontario, the decrease was from 60.4 to 56.9 years over the period. This is particularly important if one considers the impact of the disease in shortening life expectancy and reducing the number of productive years.

TABLE 1

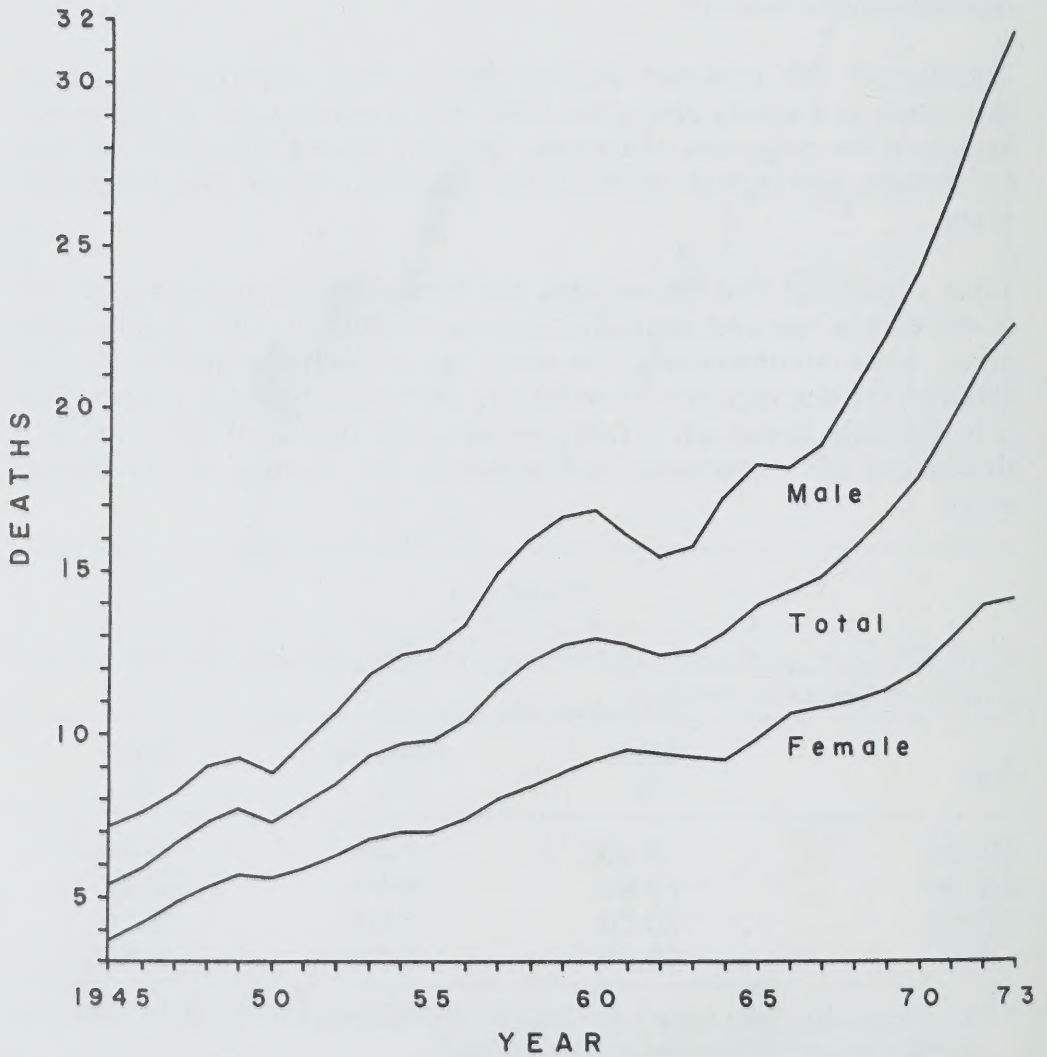
AVERAGE ANNUAL PERCENTAGE CHANGE IN CIRRHOSIS DEATH RATES BY AGE AND SEX IN ONTARIO, 1950-1972.\*

Age	Male %	Female %	Total %
20-34	8.33	1.30	5.30
35-49	12.91	9.49	12.37
50-64	10.50	5.60	8.39
65+	5.92	2.72	4.50

\* The primary data were taken from Ontario Vital Statistics (5); the death rates were calculated as centred two-year moving averages.

## GRAPH 2

CIRRHOSIS DEATH RATES IN ONTARIO, 1945-1972 (5).





Furthermore, it takes many years for cirrhosis to develop. Hence, the decline in age also indicates that unhealthy forms of alcohol use have become more common among increasingly younger age groups. Consistent with this observation is the very marked increase in admissions of young persons to various alcoholism treatment services (8).

That the trend in cirrhosis deaths is not merely a reflection of what is happening to the overall death rate is evident from Graph 3. Indeed, in Ontario in recent years, cirrhosis has been the most rapidly increasing cause of death in the adult population, followed by cancer of the lung and bronchus, and death by suicide (Table 2). Apparently the two causes of death in the adult population which have risen most rapidly are potentially the most preventable diseases. Lung cancer is as closely related to smoking as cirrhosis is to drinking—both being behaviors which have been termed “self-indulgent.” In this regard, a characteristic of mortality in Canada, and more generally in the Western World during the last 20 years, has been lack of improvement and even some increase in the general mortality of middle-aged men. This is in contrast to the mortality of other segments of the population which has shown improvement. The explanation for this trend lies largely in the rapid increase of diseases related to alcohol and tobacco use which have affected men of this age range more than any other group.

TABLE 2

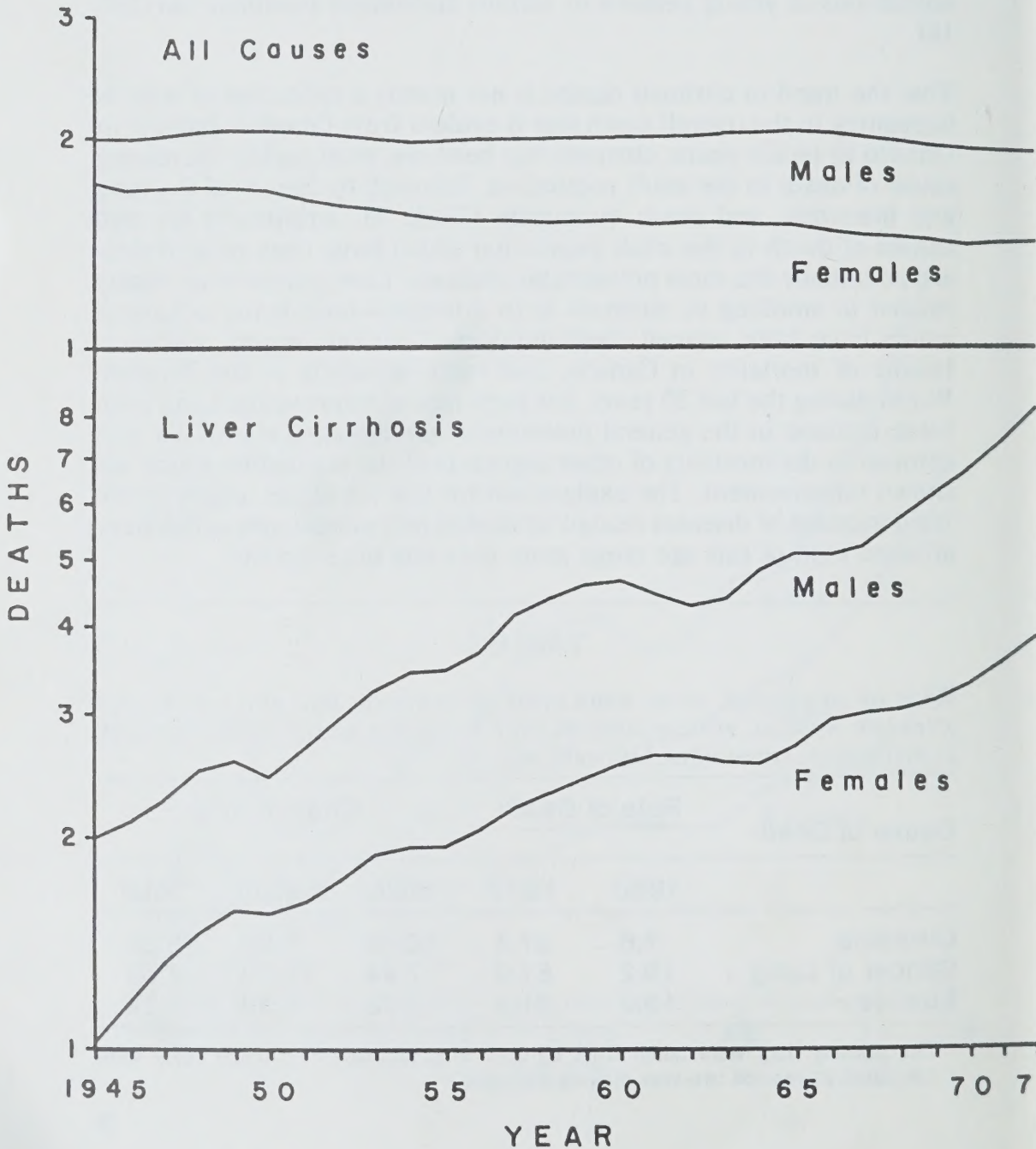
RATE OF DEATH PER 100,000 POPULATION 25 YEARS OF AGE AND OLDER, AND AVERAGE ANNUAL PERCENTAGE CHANGE IN DEATH RATES FROM CIRRHOSIS, LUNG CANCER, AND SUICIDE, ONTARIO, 1950-1972.\*

Cause of Death	Rate of Death		Change in %		
	1950	1972	Male	Female	Total
Cirrhosis	7.6	21.4	10.59	6.69	8.25
Cancer of Lung	19.2	51.0	7.44	10.53	7.53
Suicide	13.6	21.2	1.76	5.39	2.54

\* The primary data were taken from Ontario Vital Statistics (5); death rates were calculated as centred two-year moving averages.

### GRAPH 3

RATE OF DEATH FROM ALL CAUSES AND FROM CIRRHOSIS IN THE POPULATION 25 YEARS OF AGE AND OLDER, ONTARIO, 1945-1972 (5).





## **The Importance of Legal Controls**

These upward trends in the prevalence of heavy use, and the recognition of the importance of overall alcohol use in the population in producing such trends, has led to a revival of interest in control policy as a potentially important preventive strategy. Controls tend to focus on the population at large rather than on individuals—a focus which is consistent with the finding that changes in the general consumption level have a bearing on the health of the people.

It would go beyond the scope of this article to elaborate on the many restrictions on alcohol availability through which control can be exercised. Legislative enactments dealing with one or another aspect of alcohol consumption are as old as written laws and the literature in this area of study is vast. However, in an extensive recent review (9), it was concluded that price levels and the extent of availability affect the consumption level. More specifically, the evidence seems to support at least the following conclusions:

1. In many respects, alcoholic beverages behave like other commodities on the market, so that their consumption is affected by their price level.
2. Whenever beverage alcohol becomes more readily available because of a relaxation in control laws, levels of consumption and rates of alcohol problems tend to increase.

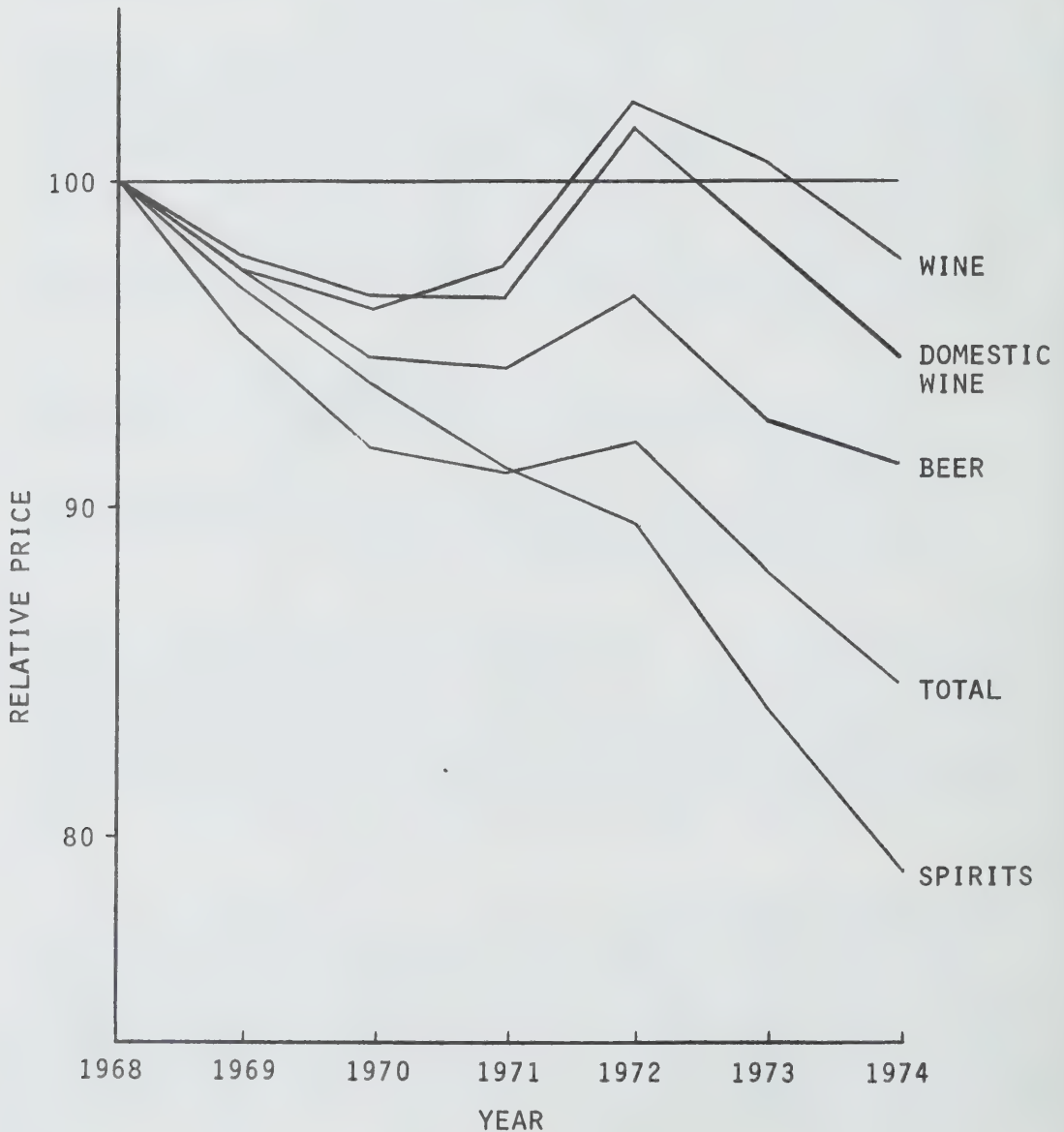
These conclusions are particularly relevant in the light of a recent tendency in many parts of the Western World, including Ontario, to relax alcohol restrictions. Furthermore, the cost of beverage alcohol, relative to other consumer goods, has been permitted to decline from year to year in virtually every jurisdiction for which such information is available (10). Graph 4 below illustrates this trend for Ontario.

## **Policy Recommendations**

It is now generally accepted that, in the use of legal controls of availability and cost, governments have at their disposal a potentially effective instrument for the prevention of further increases in alcohol problems. In accord with the evidence accumulated to date, a health-oriented strategy of prevention would seem to involve at least the following three components:

#### GRAPH 4

THE PRICE OF ABSOLUTE ALCOHOL IN BEER, WINE, AND SPIRITS RELATIVE TO THE CONSUMER PRICE INDEX LEVEL, ONTARIO, 1968-1974, 1968 = 100 (6.11).





1. A taxation policy which maintains a reasonably constant relationship between the price of alcohol and levels of disposable income (income after taxes). For example, if disposable income per capita rose 5% in a year, then the price of each alcoholic beverage offered for sale would be increased by that percentage.
2. A moratorium on further relaxation of alcohol control measures and the adoption of a health-oriented policy with respect to such measures. Essentially, this would mean that future proposals to change legislative or other provisions governing the marketing and distribution of alcoholic beverages would be tested against a health objective: the prevention of further increases in the prevalence of alcohol problems. The relevant question would become: Are the proposed changes likely to contribute to higher consumption levels and therefore to an increase in health costs?
3. An education program designed to increase public awareness of the personal hazards of heavy alcohol consumption, the economic and other consequences for society of high consumption levels, and the potential public health benefits of appropriate control measures.

The aims of these proposals are modest since their implementation would, at best, prevent further increases in consumption. The question as to how effective control measures other than taxation may be, cannot be satisfactorily answered as yet. Any attempt to evaluate such measures is greatly complicated by the fact that, taken separately, none of the many changes in liquor laws—which have occurred here and in other countries in recent years—has increased the availability of alcohol in a major way. Yet, if one compares the degree of restrictiveness of the control system of today with that which prevailed a generation ago, considerably less overall restrictiveness is quite evident. It seems highly probable that, taken as a whole, this relaxation of the control system has contributed importantly to the increase in consumption of alcohol and resulting problems. The picture is further complicated by the fact that the liberalization of the control system was not an isolated event. Concurrently, a diffusion of new drinking patterns has occurred, we have become more affluent, and the older counteracting effect of a strong temperance movement has all but disappeared. In short, relevant legal, economic, and cultural factors have tended to vary together through time, so that their separate effect on the level of

consumption and the incidence of problems is very difficult to ascertain.

Among other projects, the ARF is currently engaged in an international collaborative effort in which the experiences with controls in several countries and regions of North America and Europe are being systematically evaluated. It is hoped that this study will broaden the basis for future policy decisions on the prevention of alcohol-related problems.

### **Forecasting of Consumption**

In conclusion, we may ask what the future holds with respect to alcohol use. There exist many methods to forecast the demand for a commodity but, by and large, all of these are based on the interpretation of past behavior of factors known to influence demand. In the case of alcoholic beverages these are: 1. personal disposable income, 2. real price and the prices of related commodities that may serve as substitutes or complements, e.g. soft drinks, and 3. changes in taste as reflected in trends in beverage preference. Recently, a set of forecasting equations has been developed which performed very well over a historical sample period as shown in Graph 5 (11). The dotted line from 1972 to 1984 represents a forecast of demand which utilizes these equations and data generated by Informetrica Limited (13), a national forecast service.

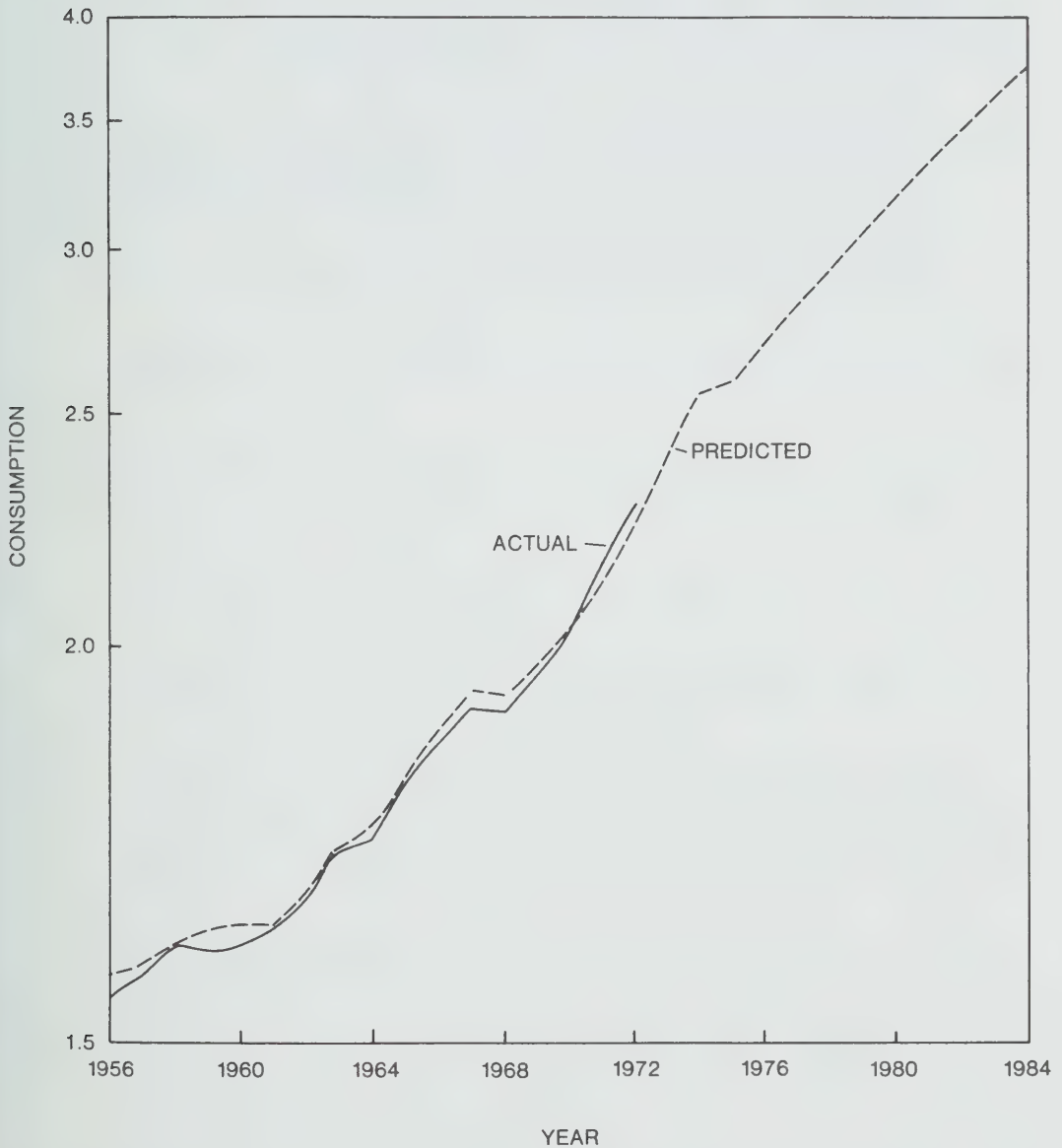
The forecast indicates that the consumption per adult in Canada will continue to increase at roughly the same rate experienced during the period 1956 to 1972, with minor variations from year to year. Over the entire forecast period, consumption is seen to reach 3.95 gallons per adult which represents a 73% increase over the level of 1972. Owing to the nature of the relationship between per capita consumption and the prevalence of heavy drinkers, an even larger increase would be predicted in the latter.

Obviously forecasts rely, to a large extent, on historical data. No matter how sophisticated the methods used, there is always the possibility that new factors may come into play that could affect consumption one way or the other. However, econometric analysis has generally proved very successful in making predictions and it may well be that, in the absence of a concerted preventive effort, the predicted levels of alcohol use will actually occur.



## GRAPH 5

PREDICTED AND ACTUAL CANADIAN CONSUMPTION OF  
ALCOHOLIC BEVERAGES (GALLONS OF ABSOLUTE ALCOHOL  
PER ADULT).



As has been pointed out, an effective program of prevention will have to take into account the importance of control measures. In this regard, we cannot do better than conclude with Edward's (14) succinct analysis of the problem:

*The reasons why a person drinks abnormally are connected with both his personality and with his environment; his drinking will, in fact, result from an interaction of the two, so that, for example, an anxious person living where alcohol is cheap and attitudes to drinking are permissive will be more likely to become an excessive drinker than an anxious person who finds alcohol more difficult to obtain and attitudes less approving. . . . Since we are not able to manipulate personality and produce a race with no neuroses, the only realistic method of exerting a benign influence on the prevalence of chronic alcohol problems is by control of environmental conditions of drinking and it is the availability element that remains the prime candidate for control.*



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